

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

A Method of Dewatering Pulp

We, THOMAS JOSEF HEIMBACH G.m.b.H., a German Company, sole proprietors of the firm THOMAS JOSEF HEIMBACH G.m.b.H. & Co. of Düren, Rhineland, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 THE PRESENT INVENTION relates to methods of forming, draining and drying of sheets in the paper industries.

At present, continuous sheets as produced by the above-stated industries are mostly drained on so-called wires and felts and subsequently dried by means of felts. Furthermore, machines have become known in which wires have also been used in the so-called drier section.

20 In this connection, a wire is generally defined as an endless belt of woven fabric, the latter being of metallic and/or, more recently, synthetic fibres.

The task of the wire in the wet section consists in removing water from the original stock in such a way as to give a sheet of high uniformity and dry content, conforming to such additional requirements regarding fibre distribution, fibre orientation, opacity and surface properties as may be dictated by the type and final use of the finished product. This task has to be performed by the wire on its way from the stock chest to the point where the sheet is transferred from the wire to the next section of the machine, whence the time available depends on the length of this way and on the machine speed.

40 The wires as designed up to now have a wire gauze structure which limits the extent to which they can perform their complex task. For instance, a coarser gauge may increase the rate of drainage of the wire but

will often be unsatisfactory with regard to sheet formation, wire marking, etc. A fine gauge wire will give less water removal and will wear faster because of the finer cross-section of the constituent wire strands. Thus, the wire will in effect often limit output and quality of the product.

As stated before, certain machines also employ wires in the drier section. Problems there are often similar to those mentioned for the wet section.

In order to avoid these disadvantages the general object of the present invention is to replace the conventional wire by a conveyor belt having apertures required for draining or drying, respectively, the stock or sheet.

The invention consists in a method of dewatering paper pulp, in which the pulp is dewatered on an endless belt made of a non-textile metal or synthetic resin sheet having apertures. By 'non-textile' we mean not woven or knitted but produced from a uniform sheet. The sheet may be made of one or more layers of suitable material by punching, pressing, drilling or milling. Individual sheets may be assembled to form endless belts by any known process such as welding or pasting the ends together.

Such conveyor belts are substantially more resistant to wear and less sensitive to all external influences than conventional wires because their solid mass may be greater and they may be made of more resistant material. While conventional wires make contact with another surface at a large number of individual points, the conveyor belt as proposed herein will present a plane of contact. The pressure exerted by such a conveyor belt on any area of actual contact is thus less than the one exerted by a conventional wire. This in connection with the fact that there are no wire strands running in the machine direction prevents

the formation of grooves in the suction box covers. In addition, the sealing of the suction boxes is greatly improved whereby losses caused by leakage are reduced. Furthermore, the low friction makes it possible to apply a higher vacuum and thereby increase the machine output. Owing to the fact that the edges of the conveyor belt are perfectly smooth, the problem of guidance by means of the known wire guides is greatly simplified.

The drainage characteristics of the conveyor belt according to the present invention may be varied within wide limits by suitable choice of the shape, size, number, and arrangement of the apertures provided for drainage. This wide range of possible variations also permits the most suitable conditions for avoiding wire marks.

In practical application, the apertures of the conveyor belt may show any desired cross-section such as round, oval, angular, slot-like, etc. They may have parallel or tapered walls, or the walls may be tapered at one end only. Finally, the axes of the apertures may run perpendicular or at any other angle to the plane of the belt.

The invention will now be described, by way of example only, with reference to the accompanying drawings showing diagrammatic views of several preferred designs of conveyor belts.

Figure 1 is a plan view of the belt.

Figures 2 to 8 show a number of possible cross-sections of the apertures and

Figures 9 to 14 similarly show a number of possible longitudinal sections.

Referring now to the drawings in detail, the conveyor belt 1, intended to be used on papermaking machines, is made of a perforated metal or synthetic sheet. The apertures 2 may have a round cross-section and be produced by punching cylindrical holes as shown in Figure 9. In this case the axes of the apertures are at right angles to the plane of the belt.

In Figures 2 to 8, various cross-sectional shapes and arrangements of the apertures

are indicated. In particular, Figure 2 shows a slot-like aperture 2a extending at right angles to the direction of movement of the belt, while the slot-like aperture 2b shown in Figure 3 runs parallel to this direction and the slot-like aperture 2c in Figure 4 lies at an angle of approximately 45° to it.

In Figure 5 an aperture 2d is shown having a square cross-section while the aperture 2e illustrated in Figure 6 is rectangular, 2f shown in Figure 7 cruciform, and 2g in Figure 8 oval in cross-section. One and the same conveyor belt may be provided with apertures of one of these types only or with apertures of different types.

The apertures 2h and 2i shown in Figure 10 and 11 respectively have tapered walls, the larger diameter appearing at the lower side of the belt 1 in Figure 10 and at the upper side of the belt 1 in Figure 11.

Apertures 2k and 2l shown in Figures 12 and 13 respectively have a funnel-like longitudinal section, the cylindrical portion of the funnel being shown adjacent to the upper surface of the belt 1 in Figure 12, and adjacent to the lower surface in Figure 13. Finally, Figure 14 shows an aperture 2m the axis of which is not perpendicular to the plane of the belt 1.

WHAT WE CLAIM IS:—

1. A method of dewatering paper pulp in which the pulp is dewatered on an endless belt made of a non-textile (as defined above) metal or synthetic resin, sheet having apertures.

2. A method as claimed in claim 1, in which the belt comprises several such metal or synthetic resin sheets.

3. A method as claimed in claim 1, in which the walls of the apertures are parallel or tapered along their full length or tapered at one end only.

4. A method as claimed in Claim 1 substantially as described above and shown by the accompanying drawings.

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Fig. 1

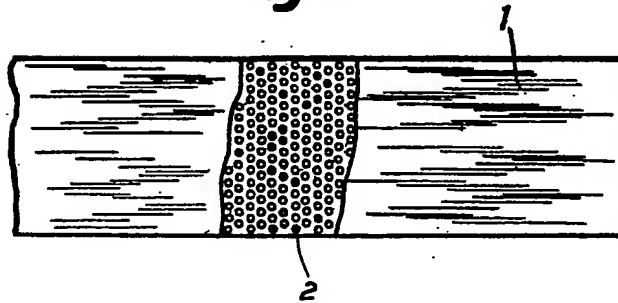


Fig. 2

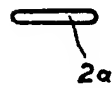


Fig. 3

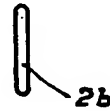


Fig. 4



Fig. 5

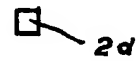


Fig. 6



Fig. 7

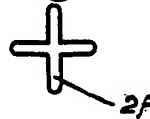


Fig. 8



Fig. 9

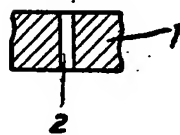


Fig. 10

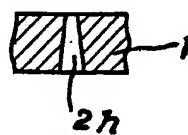


Fig. 11

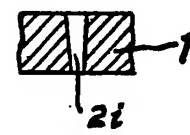


Fig. 12

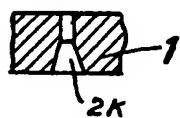


Fig. 13

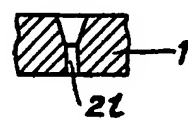


Fig. 14

